

Application No. 09/719,948
Amendment dated April 28, 2004
Response to Office Action dated January 28, 2004

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A rolling bearing comprising at least an outer ring having an outer ring raceway, an inner ring having an inner ring raceway, and rolling elements rotatably disposed between the outer ring raceway and the inner ring raceway, and used under one of lubrication with a lubricating oil, a grease containing a fluoro-containing polymer, and in an atmosphere containing a gas comprising fluorides, wherein the bearing comprises ball bearings with a contact angle from 10° to 45°, wherein the raceway surface roughness of the outer ring and the inner ring is 0.05 μm Ra or less and the ratio of the raceway surface roughness of the outer ring or the inner ring relative to the surface roughness of the rolling element is 6 or less.
2. (previously presented) The rolling bearing as defined in claim 1, wherein the contact angle is from 15° to 30°.
3. (cancelled)
4. (original) The rolling bearing as defined in claim 1 or 2, wherein at least the rolling element is formed of an alloy steel with a Cr content of 7% by weight or more and 27% by weight or less, and fine carbides are uniformly dispersed on the surface.
5. (previously presented) The rolling bearing as defined in claim 1 or 2, wherein at least the rolling element comprises oxide ceramics or has a dense nitride layer on the surface of the rolling element and the rolling surface roughness of the rolling element is 0.005 μm Ra or less and the rolling surface hardness is Hv 900 or more.
6. (previously presented) The rolling bearing as defined in claim 1 or 2, wherein particles with a mean diameter in excess of 3 μm are not present at least on the raceway surface of the outer ring and the inner ring.

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7. (previously presented) The rolling bearing as defined in claim 1 or 2, wherein a hard layer having a hardness higher than that of the raceway surface of the outer ring and the inner ring is coated at least to the rolling surface of the rolling element.

8. (previously presented) A rolling bearing comprising an outer ring having an outer ring raceway, an inner ring having an inner ring raceway, and rolling elements rotatably disposed between the outer ring raceway and the inner ring raceway, and a cage for evenly distributing the rolling elements in the rotational direction of the rolling elements between the outer ring raceway and the inner ring raceway, and used under one of lubrication with a lubricating oil, a grease containing a fluoro-containing polymer, and in an atmosphere containing a gas comprising fluorides, wherein

the cage is formed with an advanced resin material into a circular shape, a plurality of pockets each containing the rolling element through an opening and rotatably holding the same are disposed at a predetermined distance in the circumferential direction, the size for the opening of a pocket having a weld line has a value of 93% or more of the diameter of the rolling element, and the size for the opening of at least two other pockets is 80% or more and 93% or less for the diameter of the rolling element.

9. (currently amended) A rolling bearing comprising an outer ring having an outer ring raceway, an inner ring having an inner ring raceway, and rolling elements rotatably disposed between the outer ring raceway and the inner ring raceway, and a cage for evenly distributing the rolling elements in the rotational direction of the rolling elements between the outer ring raceway and the inner ring raceway, and used under one of lubrication with a lubricating oil, a grease containing a fluoro-containing polymer and in an atmosphere containing a gas comprising fluorides, wherein

the cage is constituted with a PTFE resin material or a PPS resin material and constituted by applying chamfering to inner and outer diametrical sides [of the pocket] and forming a through hole, in the bottom of the pocket, respectively.

10. (previously presented) A rolling bearing comprising an outer ring having an outer ring raceway, an inner ring having an inner ring raceway and rolling elements rotatably

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disposed between the outer ring raceway, and the inner ring raceway, and a cage for evenly distributing the rolling elements in the rotational direction of the rolling elements between the outer ring raceway and the inner ring raceway, and used under one of lubrication with a lubricating oil, a grease containing a fluoro-containing polymer and in an atmosphere containing a gas comprising fluorides, wherein

the cage is formed with an advanced resin material into a circular shape, and a plurality of pockets each containing the rolling element through an opening and rotatably holding the same are disposed at a predetermined distance in the circumferential direction, the size for the opening of the pocket having a weld line has a value of 93% or more of the diameter of the rolling element, and the size for the opening of at least two other pockets is 80% or more and 93% or less of the diameter of the rolling element and the cage is constituted with one of a PTFE resin material and a PPS resin material and constituted by applying chamfering inner and outer diametrical sides of the pockets and forming a through hole in the bottom of the pocket.

11-12. (cancelled)

13. (previously presented) The rolling bearing as defined in claim 4, wherein at least the rolling element has a dense nitride layer on the surface of the rolling element and the rolling surface roughness of the rolling element is 0.005 μm Ra or less and the rolling surface hardness is Hv 900 or more.

14. (cancelled)

15. (previously presented) The rolling bearing as defined in claim 5, wherein the contact angle is from 15° to 30°.